In the Claims

1. (Original) A cardiac assist system for implanting in the body of a patient, the cardiac assist system comprising:

a main module;

an magnetic-resonance imaging-hardened auxiliary module; and

a communication channel between said main module and said magnetic-resonance imaging-hardened auxiliary module;

said magnetic-resonance imaging-hardened auxiliary module detecting, through said communication channel, failure of said main module;

said magnetic-resonance imaging-hardened auxiliary module including a controller for activating said auxiliary module upon detection of failure of said main module.

2. (Original) The cardiac assist system as claimed in claim 1, wherein said main module is a demand pacemaker.

3. (Original) The cardiac assist system as claimed in claim 1, wherein said main module is a pacemaker having VVI functionality.

4. (Original) The cardiac assist system as claimed in claim 1, wherein said main module is a pacemaker having a defibrillator function.

5. (Original) The cardiac assist system as claimed in claim 1, wherein said main module is a pacemaker having a cardioversion function.

6. (Original) The cardiac assist system as claimed in claim 1, wherein said magnetic-resonance imaging-hardened auxiliary module is a fixed-rate pacemaker.

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7. (Original) The cardiac assist system as claimed in claim 1, wherein said main module includes:

a portable power source;

a sensor connector coupled to a lead from a cardiac sensor;

a controller connected to said sensor connector;

a pulsing electrode connector connected to said controller and coupled to a lead of a cardiac pulsing electrode; and

a signaling system for communicating the status of said main module to said magnetic-resonance imaging-hardened auxiliary module.

8. (Original) The cardiac assist system as claimed in claim 1, wherein the magnetic-resonance imaging-hardened auxiliary module further includes:

fixed-rate magnetic-resonance imaging-hardened pacing unit circuitry;

an magnetic-resonance imaging-hardened independent power source; and

mode switching circuitry;

said magnetic-resonance imaging-hardened auxiliary module being coupled to a magnetic-resonance imaging-hardened lead.

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9. (Currently Amended) A signaling system for a two-module implantable cardiac assist system ~~medical device~~ having a main module and an auxiliary module, the main module having a lead system to transmit pacing signals to a heart and to receive signals representing sensed characteristics of the heart, the auxiliary module having a fixed-mode pacing circuit and a lead system to transmit fixed-mode pacing signals to the heart, comprising:

signaling means in the main module for generating a signal to the auxiliary module, said signal representing that the main module has ceased transmitting pacing signals to the heart ~~a status of the main module or an instruction for the auxiliary module to activate~~;

sensing means in the auxiliary module, in response to the signal from said signaling means, for determining if the auxiliary module should activate; and

a switch to activate the auxiliary module to generate the fixed-mode pacing signals when the sensing means determines that the signal from said signaling means indicates that the auxiliary module should activate.

10. (Currently Amended) The signaling system for a two-module implantable medical device as claimed in claim 9, wherein the auxiliary module is adapted to function in standby mode except in the event that the main module has ceased transmitting pacing signals to the heart ~~of failure of the main module~~.

11. (Original) A cardiac assist system, comprising:

a primary device housing;

said primary device housing having a control circuit therein;

a shielding formed around said primary device housing to shield said primary device housing and any circuits therein from electromagnetic interference; and

a lead system to transmit and receive signals between a heart and said primary device housing;

said control circuitry including an oscillator and amplifier operating at an amplitude level above that of an induced signal from a magnetic-resonance imaging field.

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12. (Currently Amended) A cardiac assist system, comprising:

a primary device housing;

said primary device housing having a control circuit therein;

a shielding formed around said primary device housing to shield said primary device housing and any circuits therein from electromagnetic interference;

a lead system to transmit and receive signals between a heart and said primary device housing;

a switch to place the control circuitry into a fixed-rate mode of operation; and

a detection circuit to detect a phase timing of an external magnetic resonance imaging pulse field;

said switch causing said control circuit to be placed into a fixed rate mode of operation when said detection circuit detects the phase timing of an external magnetic resonance imaging pulse field so as to avoid interfering with the detected external magnetic resonance imaging pulse field ~~a changing magnetic field sensor to sense a change in magnetic field around said primary housing; said switch placing the control circuitry into a fixed rate mode of operation when said changing magnetic field sensor senses a predetermined encoded changing magnetic field~~.

13. (Currently Amended) A cardiac assist system, comprising:

a primary device housing;

said primary device housing having a control circuit therein;

a shielding formed around said primary device housing to shield said primary device housing and any circuits therein from electromagnetic interference;

a lead system to transmit and receive signals between a heart and said primary device housing;

a switch to place the control circuitry into a fixed-rate mode of operation; and

a detection circuit to detect a phase timing of an external magnetic resonance imaging pulse field;

said switch causing said control circuit to turn-off and cease operation when said detection circuit detects the phase timing of an external magnetic resonance imaging pulse field so as to avoid interfering with the detected external magnetic resonance imaging pulse field ~~a~~

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~~changing magnetic field sensor to sense a change in magnetic field around said primary housing; said switch causing the control circuitry to turn off and cease operation when said changing magnetic field sensor senses a predetermined encoded changing magnetic field~~.

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